



WAYNE GLEN

(also known as the Richter Property)

A model Low Impact Development (LID) community.

Conditional Use

Tredyffrin Township Planning commission

April 28, 2014



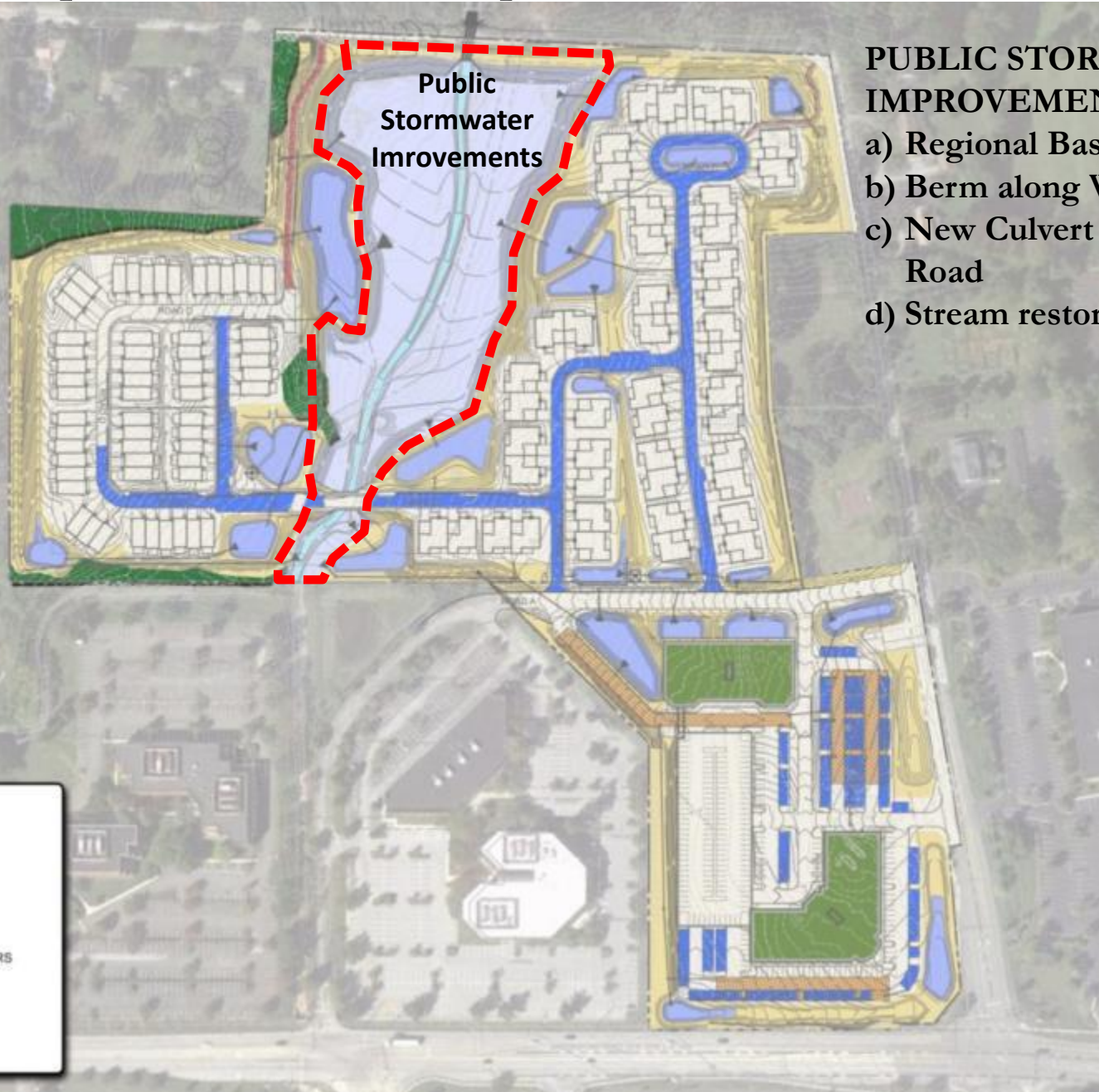
114 Forrest Avenue, Suite 201 Narberth, PA 19072
tel (610) 664-0270 / fax (610) 664-0273

Wayne Glen Overview

- **2010** – Trout Creek Watershed Study by Borton & Lawson.
 - Richter tract identified in the study for opportunity for FLOOD MITIGATION.
- **October 2012** – Trout Creek Stormwater Overlay Ordinance adopted.
- **January 4, 2013** – Wayne Glen Sketch Plan Application was submitted
- **April 22, 2013** – Wayne Glen Conditional Use Application was submitted
- **December 18, 2013** – Modified Conditional Use Application was submitted
 - Modified layout for geology and to address Planning Commission comments
- **April 21, 2014** – Updated plans and reports submitted to consolidate all revisions made in 2014 to address Township and reviewer comments.



a) Present the proposed general layout for the tract, including the project-specific and public stormwater improvements,



- PUBLIC STORMWATER IMPROVEMENTS:**
- a) Regional Basin
 - b) Berm along Walker Road
 - c) New Culvert under Walker Road
 - d) Stream restoration

LEGEND	
	REGIONAL STORMWATER BASIN
	BIO RETENTION AREAS
	UNDERGROUND BASIN
	BUILDING GREEN ROOF
	PERMEABLE PAVING - GRASSPAVERS
	PERMEABLE PAVING
	MEADOW AREAS
	FORESTED AREAS

4/21/14 Plan Update – Modifications have all been reviewed.

To address conditions:

- Grading revisions to regional basin for public works access to existing sewer trunk line
- Added alternate layout detail showing potential layout for emergency access location for carriage homes to Old Eagle School Road.

Storm water management:

- Revised permeable paver locations.
- Revised road profile sheets showing new permeable paver locations and subsurface storage.
- Revised dam grading and culvert detail.
- Modifications to stormwater details.

Geology.

- Revised by-right plan to reflect the geology (reviewed and approved)
- Letter from geo-technical engineer summarizing approach to geology.



(b) Demonstrate how the public stormwater improvements are consistent with the recommendations contained in the **2010 Trout Creek Watershed Study and Stormwater Best Management Practice Analysis**, as amended, referenced in § 208-160;

Basin performance:

- ✓ • 20% rate reduction at 100 yr storm
- ✓ • 5% rate reduction at the 2 yr storm

In addition, the TC Study recommends the following BMPs:

- ✓ • green roofs,
- ✓ • porous paving,
- ✓ • impervious surface disconnection,
- ✓ • bioretention,
- ✓ • riparian buffers,
- ✓ • floodplain preservation,
- ✓ • stormwater volume controls

(c) Demonstrate how the public stormwater improvements are consistent with the purpose and meet the standards of this article, and Chapter **174**, Stormwater Management;

(d) Demonstrate the applicant's ability to achieve the proposed public stormwater improvements;

STANDARDS OF THE OVERLAY	Required / Provided
DEVELOPMENT VOLUME CONTROL <i>100% OF THE 2-YR/24 HR STORM</i>	155,784 cubic feet
DEVELOPMENT RATE CONTROL: <i>EXCEED CH. 174 BY 50%</i>	Minimum exceedance: 75.79%
REGIONAL BASIN RATE CONTROL: <i>MEET THE TROUT CREEK STUDY'S PERFORMANCE</i>	Rate reduction: - 2 yr storm: 5% - 100 yr storm: 20%



(e) Present a long-term operations and maintenance plan that includes ownership, maintenance and funding responsibilities of all applicable parties for the public stormwater improvements and that is consistent with the requirements of Chapter [174](#), Stormwater Management;

(f) Confirm that all necessary repairs and maintenance to the public stormwater improvements are conducted within a ninety-day time frame measured from the date of written notice from the Township, or as deemed appropriate by the Township Engineer;

(g) Commit to conduct annual inspection and maintenance of the public stormwater improvements and submit an annual certification by a professional engineer whose area of expertise is stormwater management, water resources, or hydraulics and hydrology, that they continue to perform as per the approved plans to the Township;

(h) Demonstrate, where applicable, how continuous flow measurement data (rainfall, stream depth and flow) will be collected for a period sufficient to demonstrate compliance with the stormwater management provisions of this chapter; and

(i) Provide other information and supporting documentation necessary to reasonably inform the Board of Supervisors and public as to how the improvements serve the best interests of the Township and provide any other information requested by the Board of Supervisors.

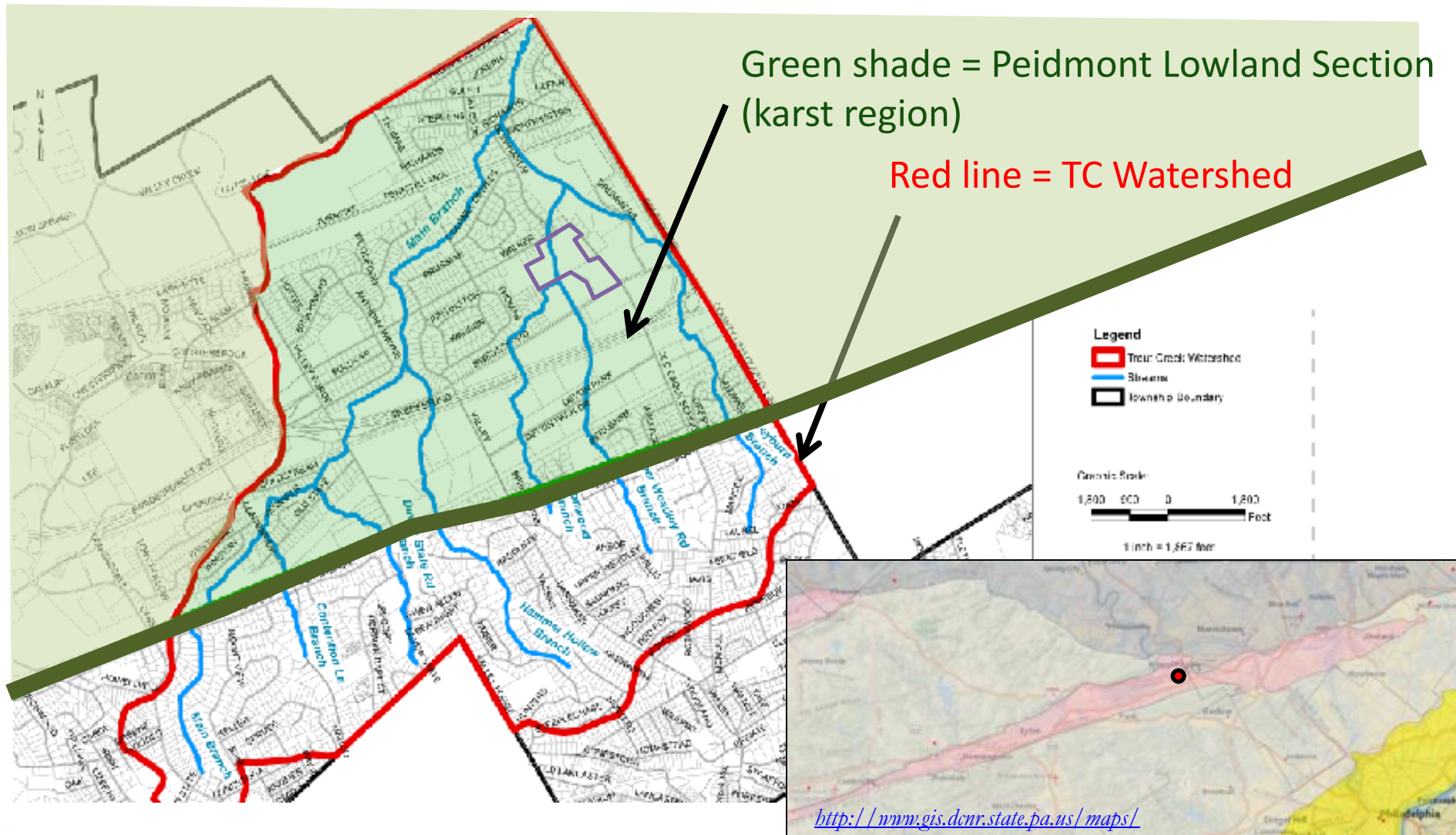


Porous pavement is identified by all of the following:

- 1. The Trout Creek Overlay explicitly permits.**
- 2. DEP's BMP manual as a karst area BMP.**
- 3. 2010 Trout Creek Watershed Study for the Richter Property.**

TROUT CREEK STORMWATER OVERLAY: APPLICABLE PROPERTY IS ALL IN KARST GEO.

TCS Overlay is applicable to property in the watershed and <400' in elevation.



KARST CONDITION IS MANAGABLE.

- Wayne Glen site is not atypical of karst geology.
- NO large subsurface voids that pose risk to development were identified.
- Soils and subsurface analyses suggest that potential sinkhole activity is likely to be limited in dimension.
- The existing karst features (sinkholes) can be remediated.



SINKHOLE REMEDIATION IS A TYPICAL REQUIREMENT FOR DEVELOPMENT IN KARST.

REMEDICATION WILL BE CONDUCTED AT ON-SET OF CONSTRUCTION

Post-remediation, a location where an existing karst feature (sinkhole) previously existed (prior to remediation) will be treated in the same manner as the remainder of the site, which is all located on karst geology.

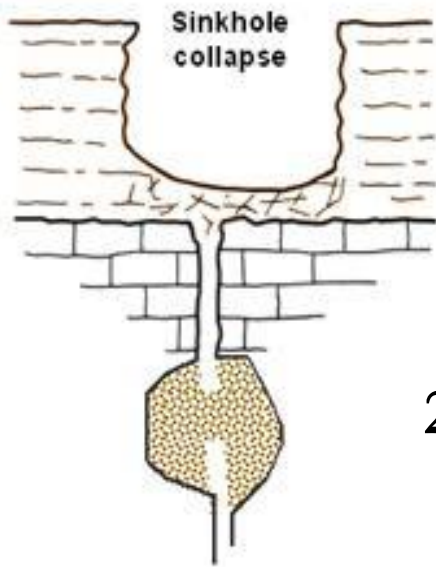


REMEDIATION METHODS

Focus on stabilizing the soil over a known fracture in the bedrock.

1. SOIL EXCHANGE (prevents soil movement)

- Excavate soil down to the bedrock
- Line the rock surface with a non-woven geotechnical fabric at the location of soil piping.
- Backfill with soil/aggregate over the filter to return to surface grade.
- Allows water to move naturally without soil movement.



2. COMPACTION GROUTING (plugs the rock)

- Injection of a low-slump grout under moderate to high pressures.

3. DYNAMIC COMPACTION (collapses voids/densifies the soil)

Dynamic compaction consists of dropping heavy weight (5-15 tons) from varying heights to improve soil characteristics as well as collapse open voids that might be present.

TROUT CREEK STORMWATER OVERLAY:

1. Karst geology is known to be in Tredyffrin and in the Trout Creek Watershed.
2. Trout Creek Overlay requires very high levels of storm water infiltration.
3. The optimal strategy for infiltration over karst is “Low Impact Development,” which spreads storm water facilities across the site.

DESIGN FOR WAYNE GLEN DOES THIS.



WAYNE GLEN STORM WATER DESIGN WILL:

- 1. Spread infiltration across the site to limit concentration.**
- 2. Maintain the natural hydrology of the site as much as possible.**
- 3. Maintain sufficient soil mantle below infiltration basins for adequate storm water filtration.**
- 4. Locate the largest infiltration basins away from identified karst features.**

